west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2839
Plant ID No.:	109-00019
Applicant:	Dominion Transmission, Inc. (DTI)
Facility Name:	Loup Creek Station
Location:	Kopperston, Wyoming County
SIC Code:	4922
Application Type:	Modification
Received Date:	April 21, 2010
Engineer Assigned:	Jerry Williams II, P.E.
Fee Amount:	$1,000.00
Date Received:	April 21, 2010
Complete Date:	May 25, 2010
Due Date:	August 23, 2010
Applicant Ad Date:	April 28, 2010
Newspaper:	*Pineville Independent Herald*
UTM's:	Easting: 449.31 km Northing: 4176.86 km Zone: 17
Description:	Replacement of a glycol dehydration unit and flare.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-2839:

Loup Creek Station is a compressor facility that services a natural gas pipeline system. The purpose of the facility is to recompress natural gas flowing through a pipeline for transportation. The compressor engines (EN01-EN04) at the facility receive natural gas from a valve on a pipeline and compresses it to enable further transportation in the pipeline. Prior to entering the pipeline, the compressed natural gas is processed by the dehydration unit. The purpose of the dehydration unit is to remove moisture from the gas stream to comply with gas quality specifications. The process to remove the moisture begins with the compressed gas being passed through a triethylene glycol dehydration system consisting of a contactor bed, a reboiler (RBR01) and associated equipment. During this process a small amount of hydrocarbons are extracted from the gas stream. The wet gas enters the contactor where moisture and some hydrocarbons are absorbed into the lean glycol. The glycol, which has become rich with

absorbed moisture and hydrocarbons, is regenerated in the still column (DEHY01) using the heat generated in the natural gas fired reboiler (RBR01) to liberate the moisture and hydrocarbon vapors. The regenerator vapors are vented to the flare (F1) to combust the hydrocarbons, thereby, reducing overall emissions and odor. The compressed, dehydrated gas then enters the pipeline. This project includes the replacement of the glycol dehydration unit. Additionally, the flare will be replaced with an upgraded unit and permitted for guaranteed control efficiency for HAP reduction.

SITE INSPECTION

A compliance inspection was conducted on March 4, 2010 by Todd Shrewsbury. The facility was operating in compliance at that time.

Directions as given in the permit application are as follows:

From I-77 at Harper Road, turn onto Route 3 North for 10.4 miles. Turn onto Route 99 West for 14.3 miles. Turn left onto Route 85 and travel 4 miles to Kopperston Grade School. Turn left onto private road and proceed to station.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Maximum controlled point source emissions from DTI's Loup Creek Station are summarized in the table below.

Emission Point ID	Emission Unit ID	Process Unit	Pollutant	Maximum Controlled Emission Rate	
				Hourly (lb/hr)	Annual (ton/year)
RBR01	RBR01	NATCO Glycol Dehydration Reboiler	Nitrogen Oxides	0.15	0.66
			Carbon Monoxide	0.13	0.55
			Volatile Organic Compounds	0.01	0.04
			Particulate Matter-10	0.01	0.05
			Sulfur Dioxide	0.01	0.01
F1	F1	Questor Flare Control Device	Nitrogen Oxides	0.01	0.06
			Carbon Monoxide	0.08	0.34
			Volatile Organic Compounds	0.03	0.13
F1	DEHY01	Glycol Dehydration Still	Volatile Organic Compounds	4.44	19.44
			Benzene	0.10	0.42
			Ethylbenzene	0.22	0.98
			n-Hexane	0.03	0.11
			Toluene	0.15	0.67
			Xylene	0.40	1.74

REGULATORY APPLICABILITY

The following rules apply to the facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

DTI would be subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR4 (To Prevent and Control the Discharge of Air Pollutants into the Open Air which Causes or Contributes to an Objectionable Odor or Odors)

45CSR4 states that an objectionable odor is an odor that is deemed objectionable when in the opinion of a duly authorized representative of the Air Pollution Control Commission (Division of Air Quality), based upon their investigations and complaints, such odor is objectionable. No odors have been deemed objectionable.

45CSR6 (To Prevent and Control the Discharge of Air Pollution from Combustion of Refuse)

The permittee has proposed to install a flare (F1). This rule defines incineration as the destruction of combustible refuse by burning in a furnace designed for that purpose. The purpose of this flare is to destroy VOC emissions through incineration. Therefore, it meets this definition.

According to 45CSR6, Section 4.1, this flare must meet the particulate matter limit by weight. The flare's proposed emission rate is less than the allowable under Section 4.1. Therefore, DTI will meet this rule.

The flare is also subject to the 20% opacity limitation in section 4.3 of this rule. Typically, the incineration of most gases produce minimal visible emissions.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that the existing equipment is permitted under a 45CSR13 permit.

45CSR30 (Requirements for Operating Permits)

DTI is an existing major source subject to 45CSR30. Changes authorized by this permit must also be incorporated into the facility's Title V operating permit. Commencement of the operations authorized by this permit shall be determined by the appropriate timing limitations associated with Title V permit revisions per 45CSR30.

The following regulations do not apply to the facility:

45CSR14 (Permits for Construction and Modification of Major Sources of Air Pollution for the Prevention of Significant Deterioration)

> The construction of the Loup Creek Station does not constitute a major modification under 45CSR14. The increased potential emissions associated with the Loup Creek Station are less than the significant amounts set forth in 45CSR14. The proposed changes result in an increase in Carbon Monoxide (0.82 TPY), Nitrogen Oxides (0.39 TPY), and Particulate Matter-10 (0.01 TPY), and a decrease in VOC emissions of 9.80 tpy. Therefore, a major modification has not occurred as a result of this permitting action.

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants: Oil and Natural Gas Production and National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

40CFR63 Subpart HHH (National Emission Standards for Hazardous Air Pollutants: Natural Gas Transmission and Storage)

> WVDEP DAQ did not determine whether the permittee is subject to an area source air toxics standard requiring Generally Achievable Control Technology (GACT) promulgated after January 1, 2007 pursuant to 40 CFR 63, including the area source air toxics provisions of 40 CFR 63, Subpart HH and 40 CFR 63, Subpart ZZZZ.
>
> These promulgated national emission standards for hazardous air pollutants (NESHAP) limit emissions of hazardous air pollutants (HAP) from oil and natural gas production and natural gas transmission and storage facilities. These final rules implement section 112 of the Clean Air Act (Act) and are based on the Administrator's determination that oil and natural gas production and natural gas transmission and storage facilities emit HAP identified on the EPA's list of 188 HAPs.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The following information was obtained from USEPA's Air Toxic Website.

Hexane
Hexane is used to extract edible oils from seeds and vegetables, as a special-use solvent, and as a cleaning agent. Acute (short-term) inhalation exposure of humans to high levels of hexane causes mild central nervous system (CNS) effects, including dizziness, giddiness, slight nausea, and headache. Chronic (long-term) exposure to hexane in air is associated with polyneuropathy in humans, with numbness in the extremities, muscular weakness, blurred vision, headache, and fatigue observed. Neurotoxic effects have also been exhibited in rats. No information is available on the carcinogenic effects of hexane in humans or animals. EPA has classified hexane as a Group D, not classifiable as to human carcinogenicity.

Benzene
Benzene is found in the air from emissions from burning coal and oil, gasoline service stations, and motor vehicle exhaust. Acute (short-term) inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic (long-term) inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidence of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. EPA has classified benzene as a Group A, human carcinogen.

Ethylbenzene
Ethylbenzene is mainly used in the manufacture of styrene. Acute (short-term) exposure to ethylbenzene in humans results in respiratory effects, such as throat irritation and chest constriction, irritation of the eyes, and neurological effects such as dizziness. Chronic (long-term) exposure to ethylbenzene by inhalation in humans has shown conflicting results regarding its effects on the blood. Animal studies have reported effects on the blood, liver, and kidneys from chronic inhalation exposure to ethylbenzene. Limited information is available on the carcinogenic effects of ethylbenzene in humans. In a study by the National Toxicology Program (NTP), exposure to ethylbenzene by inhalation resulted in an increased incidence of kidney and testicular tumors in rats, and lung and liver tumors in mice. EPA has classified ethylbenzene as a Group D, not classifiable as to human carcinogenicity.

Toluene
Toluene is added to gasoline, used to produce benzene, and used as a solvent. Exposed to toluene may occur from breathing ambient or indoor air. The central nervous system (CNS) is the primary target organ for toluene toxicity in both humans and animals for acute (short-term) and chronic (long-term) exposures. CNS dysfunction and narcosis have been frequently observed in humans acutely exposed to toluene by inhalation; symptoms include fatigue, sleepiness, headaches, and nausea. CNS depression has been reported to occur in chronic abusers exposed to high levels of toluene. Chronic inhalation exposure of humans to toluene also causes irritation of the upper respiratory tract and eyes, sore throat, dizziness, and headache. Human studies have reported developmental effects, such as CNS dysfunction, attention deficits, and minor

craniofacial and limb anomalies, in the children of pregnant women exposed to toluene or mixed solvents by inhalation. Reproductive effects, including an association between exposure to toluene and an increased incidence of spontaneous abortions, have also been noted. However, these studies are not conclusive due to many confounding variables. EPA has classified toluene as a Group D, not classifiable as to human carcinogenicity.

Xylene
Commercial or mixed xylene usually contains about 40-65% m-xylene and up to 20% each of o-xylene and p-xylene and ethylbenzene. Xylenes are released into the atmosphere as fugitive emissions from industrial sources, from auto exhaust, and through volatilization from their use as solvents. Acute (short-term) inhalation exposure to mixed xylenes in humans results in irritation of the eyes, nose, and throat, gastrointestinal effects, eye irritation, and neurological effects. Chronic (long-term) inhalation exposure of humans to mixed xylenes results primarily in central nervous system (CNS) effects, such as headache, dizziness, fatigue, tremors, and incoordination; respiratory, cardiovascular, and kidney effects have also been reported. EPA has classified mixed xylenes as a Group D, not classifiable as to human carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

The changes to this facility do not constitute a major modification under 45CSR14. Based on the nature of the emissions and the annual emission rate, no air quality impact analysis was performed.

MONITORING OF OPERATIONS

DTI will be required to perform the following monitoring:

1. Monitor and record quantity of natural gas consumed for all combustion sources.

DTI will be required to perform the following recordkeeping:

1. Maintain records of the amount of natural gas consumed in each combustion source.
2. Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
3. Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
4. Maintain records of the visible emission opacity tests conducted per the permit.
5. Maintain a record of all potential to emit (PTE) HAP calculations for the entire facility. These records shall include the natural gas compressor engines and ancillary equipment.
6. The records shall be maintained on site or in a readily available off-site location maintained by DTI for a period of five (5) years.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates DTI's Loup Creek Station meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Wyoming County location should be granted a 45CSR13 modification permit for their facility.

Jerry Williams II, P.E.
Engineer

Date